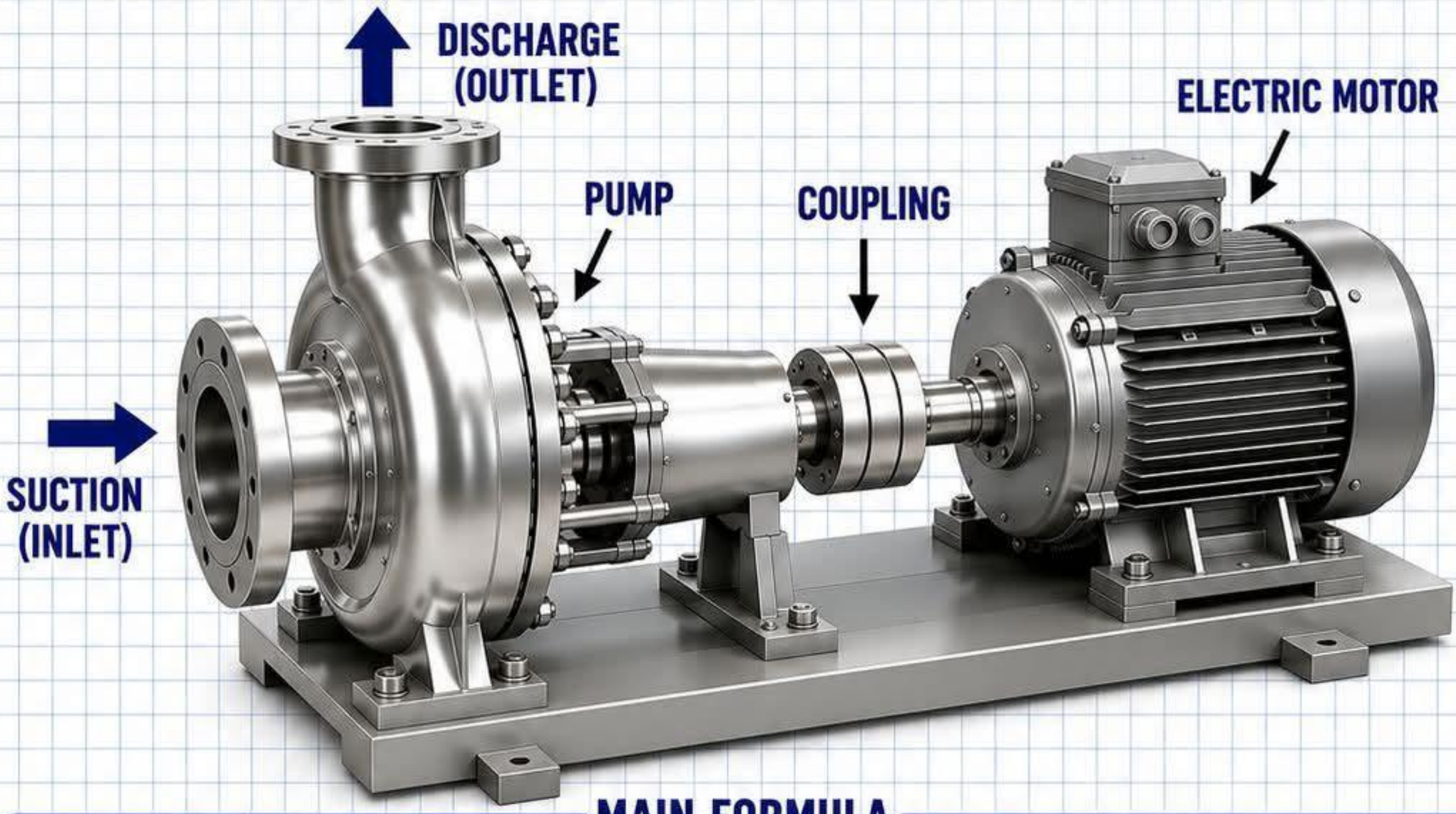
HORSE POWER (HP) CALCULATION



MAIN FORMULA

$$HP = \frac{Q \times H \times \rho \times g}{746 \times \eta}$$

Where,

- HP = Horse Power (hp)
- Q = Flow Rate (m^3/s)
- H = Total Head (m)
- ρ = Fluid Density (kg/m^3)
- g = Acceleration due to gravity (9.81 m/s^2)
- η = Overall Efficiency (decimal)

GIVEN:

- Q = 0.05 m^3/s
- H = 25 m
- ρ = 1000 kg/m^3
- g = 9.81 m/s^2
- η = 0.75

CALCULATION:

$$HP = \frac{Q \times H \times \rho \times g}{746 \times \eta}$$

$$HP = \frac{0.05 \times 25 \times 1000 \times 9.81}{746 \times 0.75}$$

$$HP = \frac{12262.5}{559.5}$$

$$HP = 21.86\ HP$$

1		6200	10x30x9 mm
2		6201	12x32x10 mm
3		6202	15x35x11 mm
4		6203	17x40x12 mm
5		6204	20x47x14 mm
6		6205	25x52x15 mm
7		6206	30x62x16 mm
8		6207	35x72x17 mm
9		6208	40x80x18 mm
10		6209	45x85x19 mm
11		6210	50x90x20 mm
12		6211	55x100x21 mm
13		6212	60x110x22 mm
14		6213	65x120x23 mm
15		6214	70x125x24 mm
16		6215	75x130x25 mm
17		6216	80x140x26 mm
18		6217	85x150x28 mm
19		6218	90x160x30 mm
20		6219	95x170x32 mm
21		6220	100x180x34 mm
22		6221	105x190x36 mm
23		6222	110x200x38 mm
24		6224	120x215x40 mm
25		6226	130x230x40 mm
26		6228	140x250x42 mm
27		6230	150x270x45 mm
28		6301	12x37x12 mm
29		6302	15x42x13 mm
30		6303	17x47x14 mm

1. PIPE SADDLE

2. PIPE HANGER

3. PIPE CLAMP

4. RIGID SUPPORT

5. SPRING SUPPORT

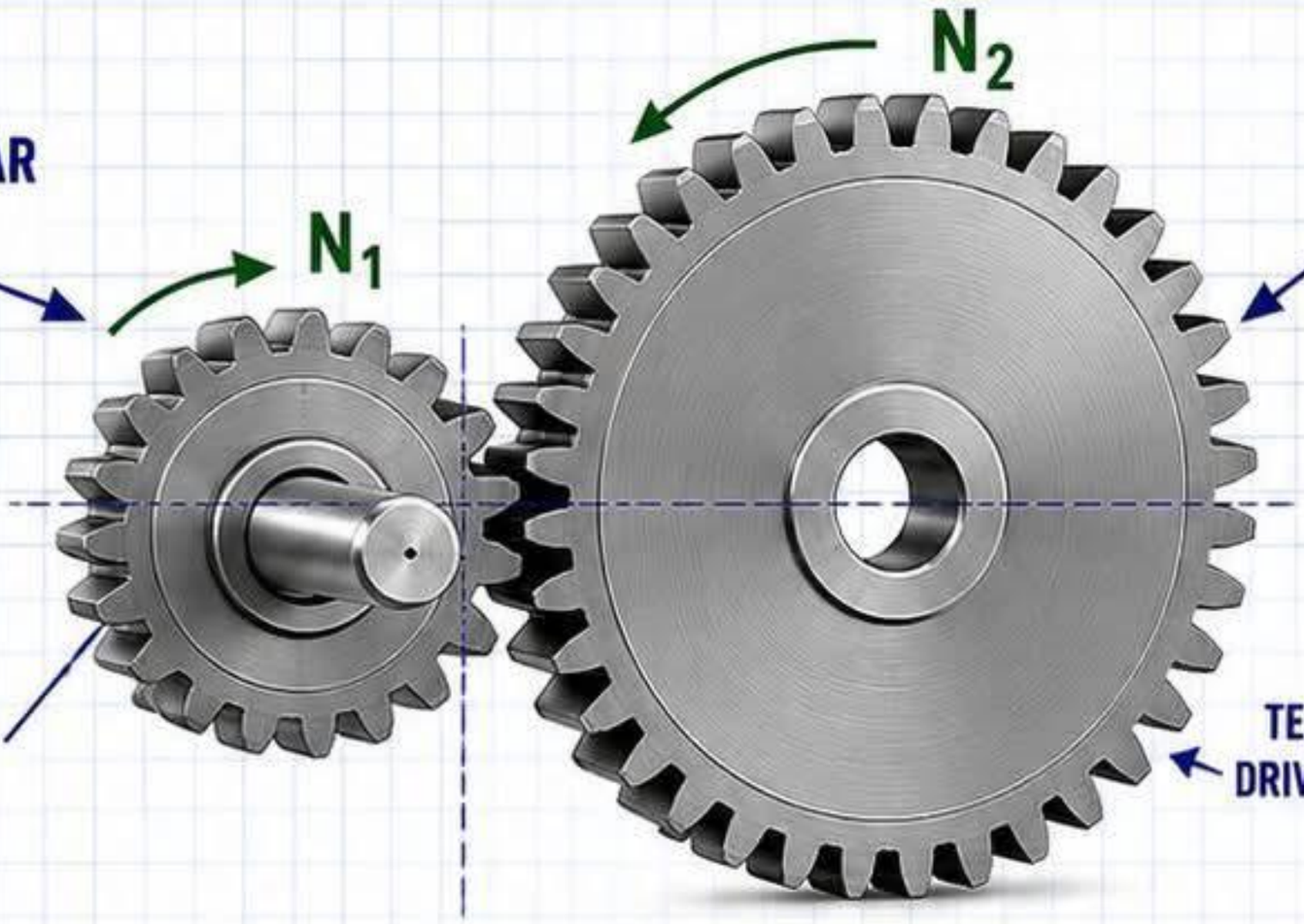
6. VARIABLE SPRING SUPPORT

7. GUIDE SUPPORT

8. REST SUPPORT

9. PIPE ROLLER SUPPORT

GEAR RATIO CALCULATION



WHERE,

T_1 = Teeth on Driver Gear
T_2 = Teeth on Driven Gear
N_1 = Speed of Driver Gear (rpm)
N_2 = Speed of Driven Gear (rpm)

MAIN FORMULA

$$\text{GEAR RATIO (GR)} = \frac{T_2}{T_1} = \frac{N_1}{N_2}$$

Where,
GR = Gear Ratio (No Unit)

GIVEN DATA:

Teeth on Driver Gear, T_1 = 20
Teeth on Driven Gear, T_2 = 80
Speed of Driver Gear, N_1 = 1200 rpm
Speed of Driven Gear, N_2 = ? rpm

STEP 1: WRITE FORMULA

$$GR = \frac{T_2}{T_1} = \frac{N_1}{N_2}$$

STEP 2: SUBSTITUTE VALUES

$$GR = \frac{80}{20} = \frac{1200}{N_2}$$

STEP 3: CALCULATE GEAR RATIO (GR)

$$GR = \frac{80}{20} = 4$$

STEP 4: FIND DRIVEN GEAR SPEED (N_2)

$$N_2 = \frac{N_1}{GR} = \frac{1200}{4} = 300 \text{ rpm}$$

FINAL ANSWER:

GEAR RATIO (GR)
4 : 1

SPEED OF DRIVEN GEAR (N_2)
300 rpm

First Coil
(Phase R)

Start
U1

Finish
U2

Second Coil
(Phase S)

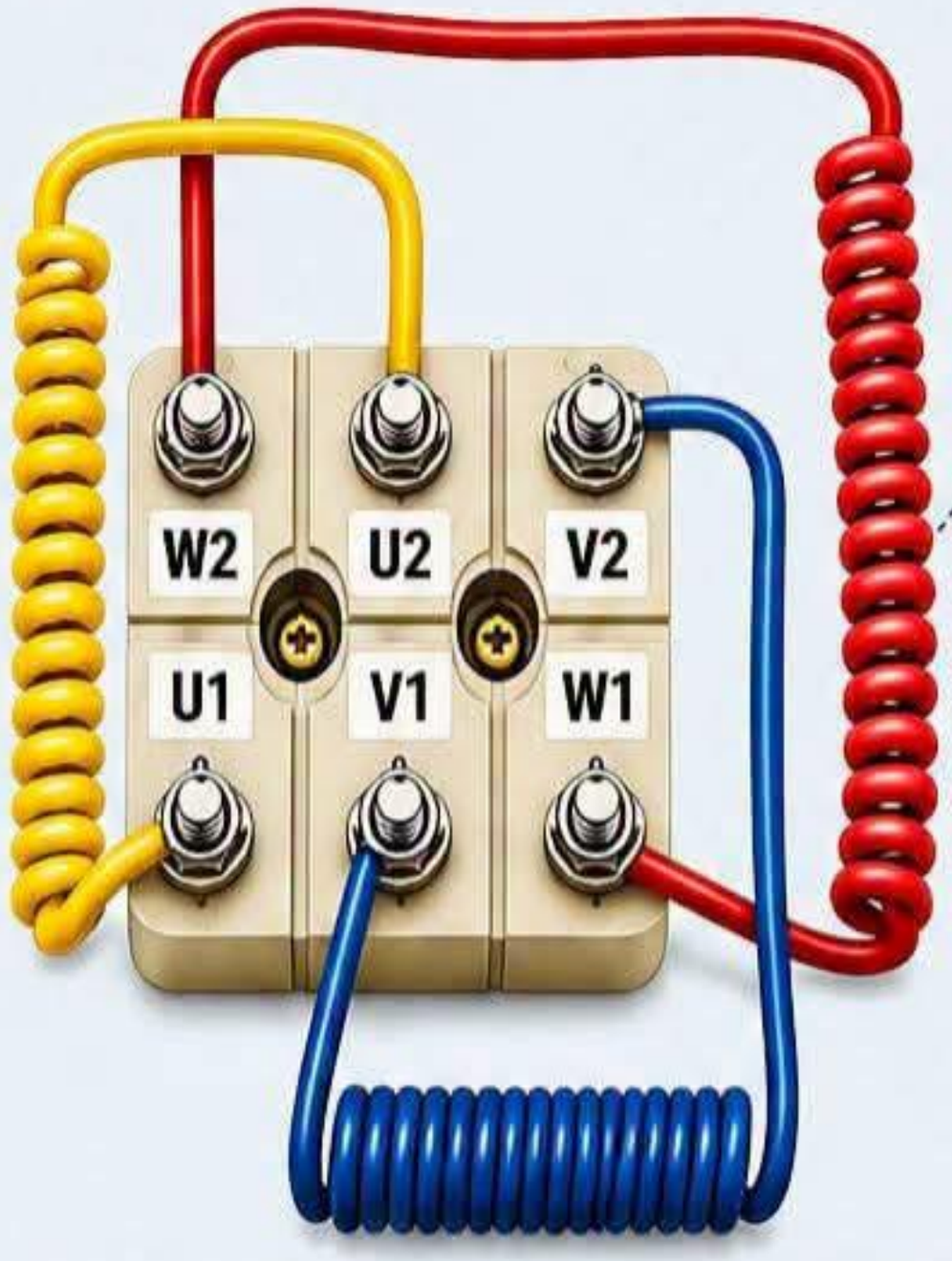
Start
V1

Finish
V2

Third Coil
(Phase T)

Start
W1

Finish
W2

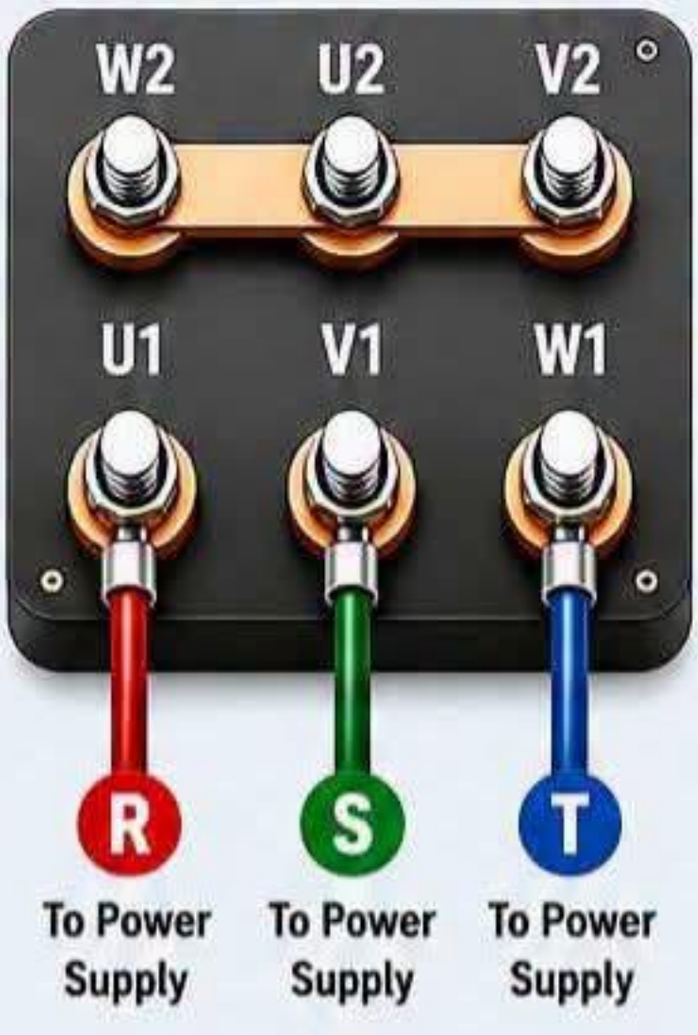


R Phase R

S Phase S

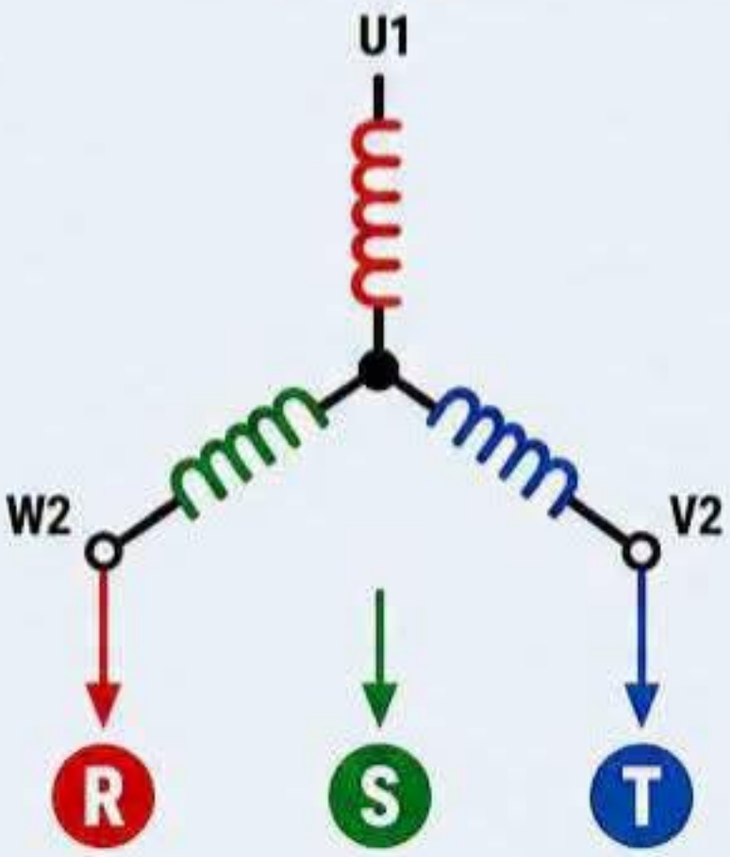
T Phase T

Star Connection (Y)

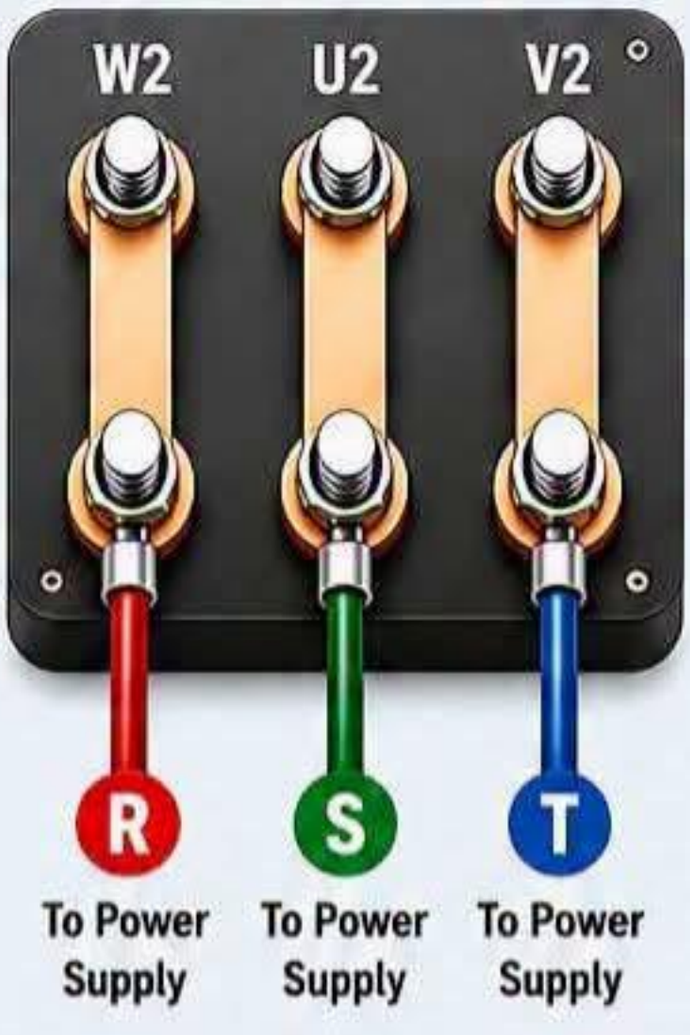


Star Connection (Y)

Used to Reduce Starting Current.

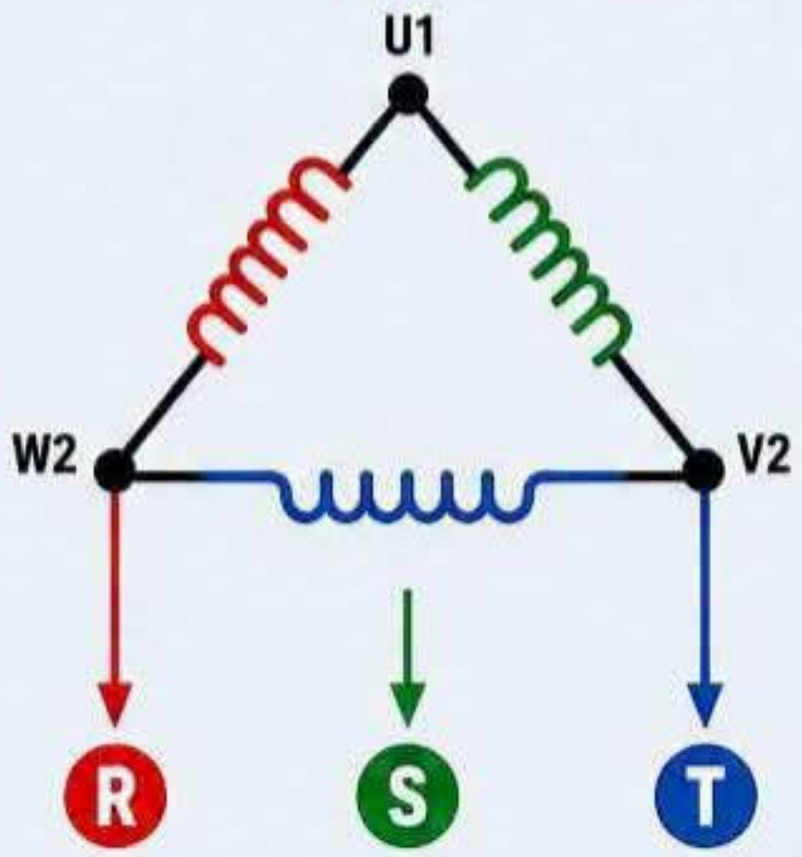


Delta Connection (Δ)

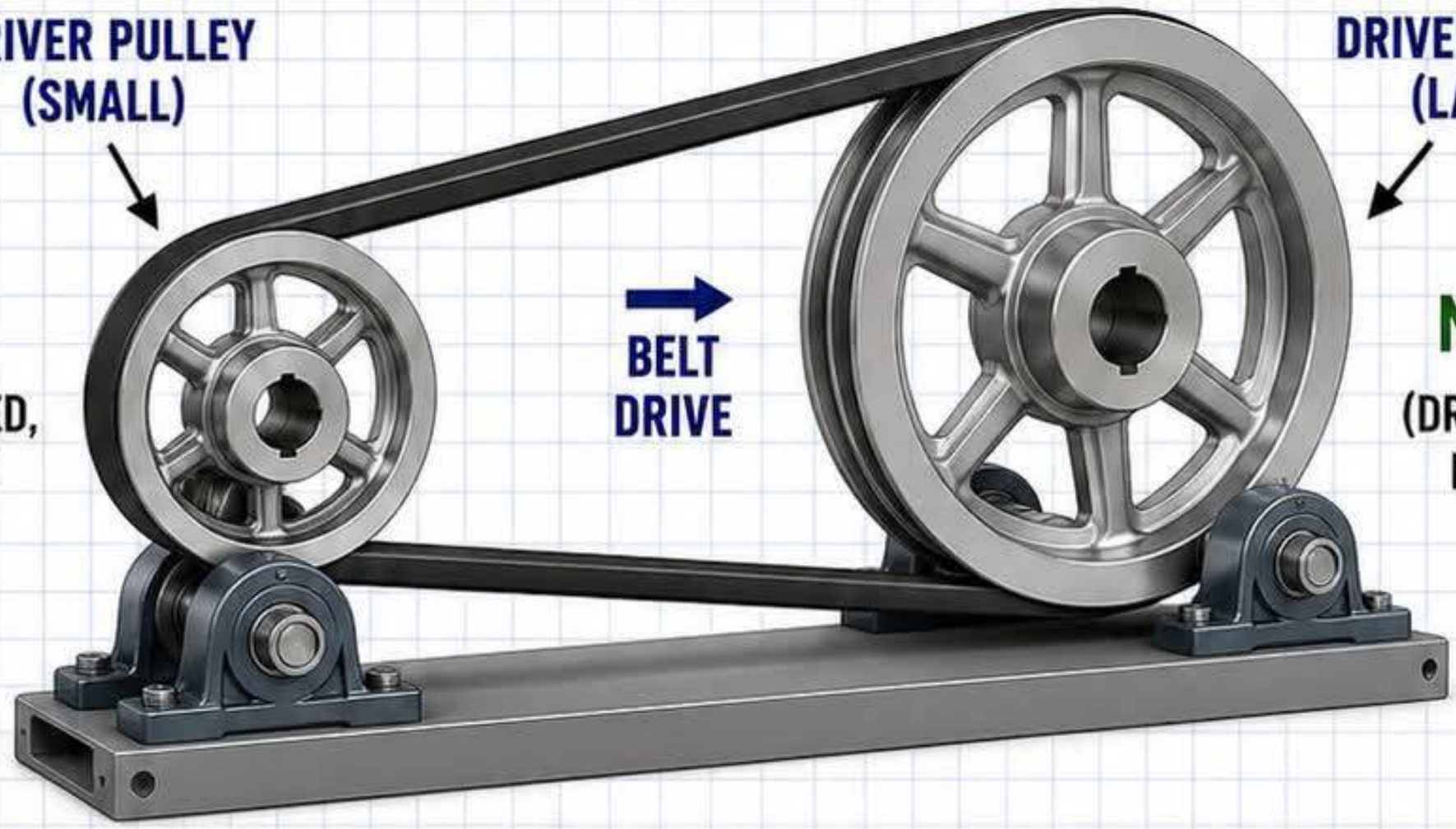


Delta Connection (A)

Used to Obtain Full Power from the Motor.



PULLEY SPEED RATIO CALCULATION



MAIN FORMULA

$$\frac{N_1}{N_2} = \frac{D_2}{D_1}$$

Where,

- N_1 = Speed of Driver Pulley (rpm)
- N_2 = Speed of Driven Pulley (rpm)
- D_1 = Diameter of Driver Pulley (mm)
- D_2 = Diameter of Driven Pulley (mm)

GIVEN DATA:

N_1 = 1440 rpm
D_1 = 200 mm
D_2 = 500 mm
N_2 = ? rpm

STEP 1: WRITE FORMULA

$$\frac{N_1}{N_2} = \frac{D_2}{D_1}$$

STEP 2: SUBSTITUTE VALUES

$$\frac{1440}{N_2} = \frac{500}{200}$$

STEP 3: CALCULATE N_2

$$N_2 = \frac{1440 \times 200}{500} = 576 \text{ rpm}$$

FINAL ANSWER:

$$N_2 = 576 \text{ rpm}$$

1. GATE VALVE

2. GLOBE VALVE

3. BALL VALVE

4. BUTTERFLY VALVE

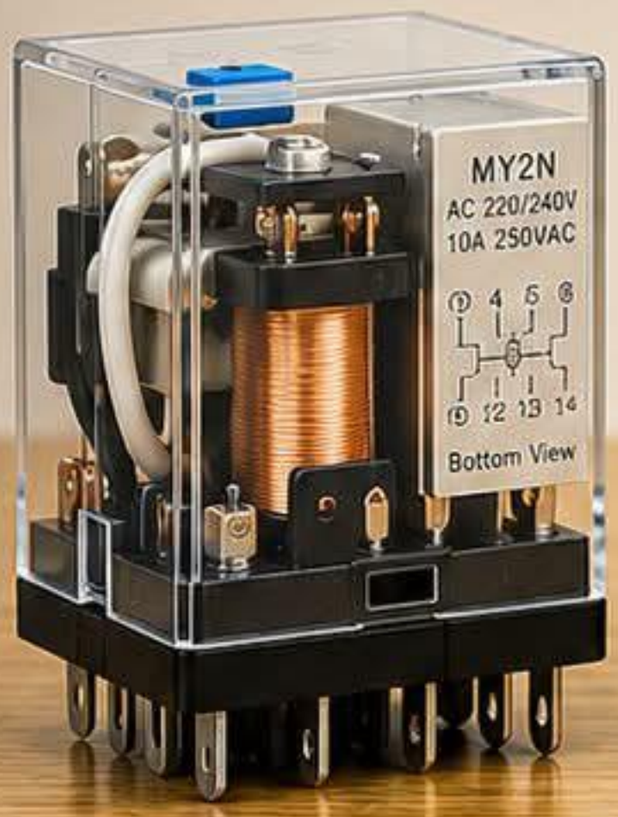
5. CHECK VALVE

6. PLUG VALVE

7. DIAPHRAGM VALVE

8. NEEDLE VALVE

9. PRESSURE RELIEF VALVE



1. ELECTROMAGNETIC RELAY

2. SOLID STATE RELAY

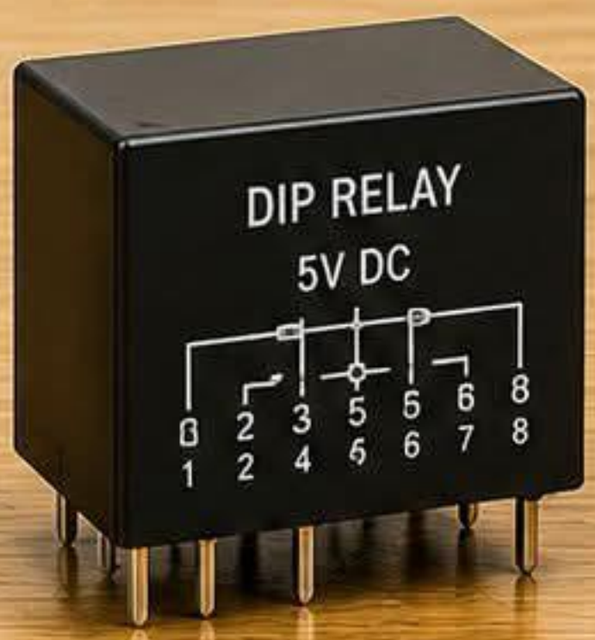
3. THERMAL OVERLOAD RELAY

4. TIME DELAY RELAY

5. LATCHING RELAY

6. REED RELAY

7. MINI RELAY



8. DIP/SIGNAL RELAY

9. BUCHHOLZ RELAY

کتنے ایمپیئر پر کون سی وائر لگانی چاہیے؟

ایمپیئر	تجویز کردہ وائر	تجویز کردہ وائر ایمپیئر
ایمپیئر (A)	1.5mm²	1-5 Amp → 1.5mm²
وائر (mm²)	2.5mm²	5-10 Amp → 2.5mm²
10-15 ایمپیئر	4mm²	10-15 Amp → 4mm²
15-25 ایمپیئر	6mm²	15-25 Amp → 6mm²
وائر (mm²)	10mm²	25-35 Amp → 10mm²